

Title (en)  
Au BONDING WIRE FOR SEMICONDUCTOR ELEMENT

Title (de)  
AU-BONDIERUNGSDRAHT FÜR EIN HALBLEITERELEMENT

Title (fr)  
FIL DE CONNEXION EN OR POUR ÉLÉMENT SEMI-CONDUCTEUR

Publication  
**EP 1830398 A4 20120606 (EN)**

Application  
**EP 05809380 A 20051122**

Priority  
• JP 2005021416 W 20051122  
• JP 2004343154 A 20041126

Abstract (en)  
[origin: EP1830398A1] Issues to be solved Au bonding wire for semiconductor device should be provided in circumstances such as reducing the diameter of bonding wire to less than 23  $\mu$  m, squashed ball with superior roundness should be formed and with strong tensile strength endurable against wire flow. Means as solution Au bonding wire for semiconductor device, consisting of Au matrix and functional additives, containing: said Au matrix alloy including 3-15 mass ppm of Be, 3-40 mass ppm of Ca, and 3-20 mass ppm of La and roundness of squashed ball said Au alloy is 0.95 -1.05.

IPC 8 full level  
**H01L 23/49** (2006.01); **C22C 5/02** (2006.01)

CPC (source: EP US)  
**C22C 5/02** (2013.01 - EP US); **H01L 24/43** (2013.01 - EP US); **H01L 24/45** (2013.01 - EP US); **H01L 2224/05624** (2013.01 - EP US); **H01L 2224/43848** (2013.01 - EP US); **H01L 2224/45015** (2013.01 - EP US); **H01L 2224/45144** (2013.01 - EP US); **H01L 2224/4845** (2013.01 - EP US); **H01L 2224/48624** (2013.01 - EP US); **H01L 2224/85207** (2013.01 - EP US); **H01L 2924/00011** (2013.01 - EP US); **H01L 2924/01005** (2013.01 - EP US); **H01L 2924/01012** (2013.01 - EP US); **H01L 2924/01013** (2013.01 - EP US); **H01L 2924/01014** (2013.01 - EP US); **H01L 2924/0102** (2013.01 - EP US); **H01L 2924/01027** (2013.01 - EP US); **H01L 2924/0103** (2013.01 - EP US); **H01L 2924/01031** (2013.01 - EP US); **H01L 2924/01032** (2013.01 - EP US); **H01L 2924/01033** (2013.01 - EP US); **H01L 2924/01038** (2013.01 - EP US); **H01L 2924/01041** (2013.01 - EP US); **H01L 2924/01047** (2013.01 - EP US); **H01L 2924/0105** (2013.01 - EP US); **H01L 2924/01051** (2013.01 - EP US); **H01L 2924/01057** (2013.01 - EP US); **H01L 2924/01058** (2013.01 - EP US); **H01L 2924/01059** (2013.01 - EP US); **H01L 2924/01063** (2013.01 - EP US); **H01L 2924/01064** (2013.01 - EP US); **H01L 2924/01078** (2013.01 - EP US); **H01L 2924/01079** (2013.01 - EP US); **H01L 2924/01082** (2013.01 - EP US); **H01L 2924/01083** (2013.01 - EP US); **H01L 2924/01205** (2013.01 - EP US); **H01L 2924/10253** (2013.01 - EP US); **H01L 2924/14** (2013.01 - EP US); **H01L 2924/19043** (2013.01 - EP US); **H01L 2924/20751** (2013.01 - EP US); **H01L 2924/20752** (2013.01 - EP US); **Y10T 428/12431** (2015.01 - EP US)

C-Set (source: EP US)  
1. **H01L 2224/45144 + H01L 2924/01014**  
2. **H01L 2224/45144 + H01L 2924/01031**  
3. **H01L 2224/45144 + H01L 2924/0105**  
4. **H01L 2224/45144 + H01L 2924/01051**  
5. **H01L 2224/45144 + H01L 2924/01083**  
6. **H01L 2224/45144 + H01L 2924/01039**  
7. **H01L 2224/85207 + H01L 2924/20105**  
8. **H01L 2224/85207 + H01L 2924/20106**  
9. **H01L 2224/43848 + H01L 2924/2011**  
10. **H01L 2224/43848 + H01L 2924/20111**  
11. **H01L 2224/45015 + H01L 2924/20752**  
12. **H01L 2224/45144 + H01L 2924/0102**  
13. **H01L 2224/45015 + H01L 2924/20751**  
14. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01057**  
15. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01058**  
16. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01058**  
17. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01063**  
18. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01012 + H01L 2924/0102 + H01L 2924/01057**  
19. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01014 + H01L 2924/0102 + H01L 2924/01057**  
20. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01031 + H01L 2924/01057**  
21. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01051 + H01L 2924/01057**  
22. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/0105 + H01L 2924/01057**  
23. **H01L 2224/45144 + H01L 2924/01004**  
24. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01083**  
25. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01012 + H01L 2924/0102 + H01L 2924/01039 + H01L 2924/01057**  
26. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01014 + H01L 2924/0102 + H01L 2924/01039 + H01L 2924/01057**  
27. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01031 + H01L 2924/01039 + H01L 2924/01057**  
28. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01012 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01058**  
29. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01012 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01063**  
30. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01014 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01058**  
31. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01014 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01063**  
32. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01031 + H01L 2924/01057 + H01L 2924/01058**  
33. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01031 + H01L 2924/01057 + H01L 2924/01058 + H01L 2924/01063**  
34. **H01L 2224/45144 + H01L 2924/01057**  
35. **H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01012 + H01L 2924/01014 + H01L 2924/0102 + H01L 2924/01031 + H01L 2924/01057 + H01L 2924/01058**

36. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01051 + H01L 2924/01057 + H01L 2924/01058  
 37. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01051 + H01L 2924/01057 + H01L 2924/01063  
 38. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/0105 + H01L 2924/01057 + H01L 2924/01058  
 39. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/0105 + H01L 2924/01057 + H01L 2924/01063  
 40. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01058 + H01L 2924/01083  
 41. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01063 + H01L 2924/01083  
 42. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/0105 + H01L 2924/01051 + H01L 2924/01057 + H01L 2924/01058 + H01L 2924/01083  
 43. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01012 + H01L 2924/0102 + H01L 2924/01039 + H01L 2924/01057 + H01L 2924/01063  
 44. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01012 + H01L 2924/0102 + H01L 2924/01039 + H01L 2924/01057 + H01L 2924/01058  
 45. H01L 2224/45144 + H01L 2924/01204  
 46. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01057 + H01L 2924/01058 + H01L 2924/01059 + H01L 2924/01062  
 47. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01039 + H01L 2924/01048 + H01L 2924/01057 + H01L 2924/01058  
 48. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01013 + H01L 2924/0102 + H01L 2924/01039 + H01L 2924/01057 + H01L 2924/01058  
 49. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01005 + H01L 2924/0102 + H01L 2924/01039 + H01L 2924/01057 + H01L 2924/01058  
 50. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01039 + H01L 2924/01049 + H01L 2924/01057 + H01L 2924/01058  
 51. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/0105 + H01L 2924/01051 + H01L 2924/01057 + H01L 2924/01063  
 52. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/01012 + H01L 2924/0102 + H01L 2924/0105 + H01L 2924/01057 + H01L 2924/01058 + H01L 2924/01064 + H01L 2924/01078  
 53. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/0105 + H01L 2924/01057 + H01L 2924/01063 + H01L 2924/01083  
 54. H01L 2224/45144 + H01L 2924/013 + H01L 2924/01004 + H01L 2924/0102 + H01L 2924/01039 + H01L 2924/01057 + H01L 2924/01058  
 55. H01L 2224/45144 + H01L 2924/013 + H01L 2924/00013  
 56. H01L 2224/45144 + H01L 2924/01205  
 57. H01L 2224/48624 + H01L 2924/00  
 58. H01L 2224/45144 + H01L 2924/01005  
 59. H01L 2224/45144 + H01L 2924/01013  
 60. H01L 2224/45144 + H01L 2924/01048  
 61. H01L 2224/45144 + H01L 2924/01059  
 62. H01L 2224/45144 + H01L 2924/01062  
 63. H01L 2224/45144 + H01L 2924/01064  
 64. H01L 2924/00011 + H01L 2924/01006  
 65. H01L 2224/45144 + H01L 2924/01049  
 66. H01L 2224/45144 + H01L 2924/01058  
 67. H01L 2224/45144 + H01L 2924/01063  
 68. H01L 2224/45144 + H01L 2924/01012

#### Citation (search report)

- [X] EP 1168439 A2 20020102 - TANAKA ELECTRONICS IND [JP]
- [X] EP 0822264 A1 19980204 - TANAKA ELECTRONICS IND [JP]
- [X] EP 0761831 A1 19970312 - TANAKA ELECTRONICS IND [JP]
- [XI] JP 2000040710 A 20000208 - SUMITOMO METAL MINING CO
- [XI] JP 2000144282 A 20000526 - MITSUBISHI MATERIALS CORP
- [XI] JP H07335686 A 19951222 - NIPPON STEEL CORP
- See references of WO 2006057230A1

#### Designated contracting state (EPC)

DE FR GB IT NL

#### DOCDB simple family (publication)

**EP 1830398 A1 20070905; EP 1830398 A4 20120606;** CN 100501956 C 20090617; CN 101065838 A 20071031; JP 4117331 B2 20080716; JP WO2006057230 A1 20080605; KR 100929432 B1 20091203; KR 20070084296 A 20070824; MY 140911 A 20100129; TW 200618146 A 20060601; TW I362078 B 20120411; US 2007298276 A1 20071227; US 8440137 B2 20130514; WO 2006057230 A1 20060601

#### DOCDB simple family (application)

**EP 05809380 A 20051122;** CN 200580040707 A 20051122; JP 2005021416 W 20051122; JP 2006547776 A 20051122; KR 20077011168 A 20051122; MY PI20055439 A 20051122; TW 94141270 A 20051124; US 79132905 A 20051122